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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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In the Matter of

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Revision of Part 15 of the Commission's Rules
Regarding Ultra-Wideband Transmission
Systems

ET Docket No. 98-153

COMMENTS

The Wireless Communications Association International, Inc. ("WCA"), by its attorneys, hereby submits its initial comments with respect to the *Notice of Proposed Rule Making* ("NPRM") issued in the above-captioned proceeding.

As the trade association of the fixed wireless broadband industry, WCA has a direct and immediate interest in the Commission's resolution of the still largely unknown technical and legal issues associated with the widespread introduction of ultra-wideband ("UWB") devices into the marketplace. The Commission notes that UWB devices typically employ pulse modulation, whereby extremely narrow pulses are modulated and emitted to convey or receive information.^{1/} As a result, depending on the signal characteristics of the particular UWB device involved, a receiver may respond to a single pulse or string of pulses emitted by a UWB device at any variety of distances and power levels. Moreover, because emission bandwidths of UWB transmissions generally exceed 1 GHz,^{2/} and because the Commission is proposing to impose "as

^{1/} NPRM at ¶ 3.

^{2/} *Id.*

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few restrictions as possible” on the operating frequencies that UWB devices may use,^{3/} UWB technology has the potential to cause harmful interference to licensed fixed wireless services in *any* frequency band, be it the 2 GHz bands allocated to the Multipoint Distribution Service (“MDS”), Instructional Television Fixed Service (“ITFS”), and Wireless Communications Service (“WCS”); the 18 and 38 GHz bands allocated to the Private Operational Fixed Service (“POFS”); the 24 GHz band allocated to the Digital Electronic Message Service (“DEMS”); and the 28 and 31 GHz bands allocated to the Local Multipoint Distribution Service (“LMDS”).^{4/} In a recent letter commenting on the Commission’s recent waivers of its Part 15 Rules to permit deployment of UWB devices on a limited basis, the National Telecommunications and Information Administration (“NTIA”) summarized the problem:

We note that the UWB devices proposed by the Petitioners represent a radically different technology from that used in conventional radios available when the Part 15 rules were developed. UWB technologies use extremely narrow pulses with their concomitant ultra-wide bandwidths, high repetition frequencies, and low duty cycles. *The effects of these types of signals upon conventional systems, be they analog, digital or pulse modulated, are not well understood.*^{5/}

^{3/} *Id.* at ¶ 27.

^{4/} See, e.g., *U.S. GPS Industry Council, American Airlines and United Airlines, Consolidated Petition for Reconsideration of Waivers Issued under Delegated Authority by the Chief, Office of Engineering and Technology*, FCC 00-29, at ¶ 3 (July 14, 2000) (“UWB devices typically use extremely narrow pulse (impulse) modulation that can produce emission bandwidths of one gigahertz or greater. The wide bandwidth can result in emissions being transmitted into the TV broadcast bands and in restricted frequency bands.”) (“*U.S. GPS Industry Council*”).

^{5/} Letter from William T. Hatch, Acting Associate Administrator, Office of Spectrum Management, National Telecommunications and Information Administration, to Dale Hatfield, Chief, Office of Engineering and Technology, Federal Communications Commission, re: *U.S.*

Though WCA does not disagree that UWB devices may prove to have useful applications in the marketplace, WCA is very concerned that the Commission has forged ahead with a formal rulemaking in this proceeding notwithstanding its concurrence that “[f]urther testing and analysis is needed before the risks of interference are completely understood.”^{6/} Indeed, the Commission acknowledges that “the establishment of emissions limits requires a firm understanding of the characteristics of UWB signals, their impact on victim receivers, and the minimum separation distance between UWB devices and victim receivers. Almost any transmitter will cause interference if it is too close to a receiver.”^{7/} In a similar vein, the Commission observes that “[f]or UWB communications systems, the emitted spectrum depends on the information being sent,” and that in the case of digital information, “the transmitted signal may become a set of spectral lines that has different interference potential than the noise-like spectrum that would be produced under normal modulation. Depending on exactly where these spectral lines are, the interference potential may increase.”^{8/} Further, the Commission acknowledges “the difficulty in controlling the location in which [UWB devices] will be used,”^{9/} and that “the cumulative impact

Radar Inc. Request for a Waiver of Part 15 for Ground Penetrating Radar et al., at 2 (June 15, 1999) (emphasis added) (footnote omitted) (the “NTIA Letter”).

^{6/} *NPRM* at ¶ 1.

^{7/} *Id.* at ¶ 32.

^{8/} *Id.* at ¶ 37.

^{9/} *Id.* at ¶ 45.

of several UWB devices may be different depending on their individual emission and transmission characteristics.”^{10/}

Moreover, the record before the Commission both in this docket and elsewhere highlights the sheer number of unknown variables that preclude an accurate assessment of the interference risks posed by UWB technology at this time. In particular, various parties have correctly noted that the wide bandwidth and other technical characteristics of UWB transmissions could present a substantial risk of unacceptable interference when multiplied over potentially thousands of UWB devices operating at the same time at a variety of power levels at any number of locations. Indeed, NTIA has already cautioned the Commission that “the proliferation of UWB systems centered near 2 GHz could cause serious problems to several critical, sensitive services important to both the government and the public.”^{11/} Similarly, as noted by the Federal Aviation Administration:

The FAA is opposed to any authorization of licensed or unlicensed UWB systems to intentionally radiate (in aeronautical frequency) bands. It is likely that authorizing even limited operation of such systems will lead to further proliferation of UWB systems as new applications for their use are developed. . . Another potential problem is in tracking down instances of interference for UWB devices. A low-power system with bandwidth on the order of several gigahertz would be difficult to trace using traditional direction-finding equipment. Proliferation of UWB systems will result in an increased potential for harmful

^{10/} *Id.* at ¶ 47.

^{11/} *NTIA Letter* at 3.

interference and a concurrent decrease in this agency's ability to safely control the nation's airspace.^{12/}

Nonetheless, in the *NPRM* the Commission has forged ahead with a proposal to permit unlicensed operation of UWB devices under Part 15,^{13/} and further indicates that it intends to impose "as few restrictions as possible" on the operating frequencies that UWB devices may use.^{14/} The Commission also makes a series of detailed proposals *vis-a-vis* emission limits, measurement procedures and other technical requirements for UWB devices,^{15/} subject to the caveat that "[a]s equipment continues to be developed and additional experience is gained with this equipment, future changes to the standards may be considered."^{16/} In other words, the Commission has proposed to adopt a detailed, comprehensive regulatory scheme for unlicensed operation of UWB devices anywhere in the United States in virtually any frequency band, even

^{12/} Letter from Gerald J. Markey, Program Director for Spectrum Policy and Management, Federal Aviation Administration, to Magalie Roman Salas, Secretary, Federal Communications Commission, re: ET Docket No. 98-153, at 1-2 (Oct. 20, 1998). *See also* Comments of Stanford University, ET Docket No. 98-153 at 3 (Sept. 7, 1999) ("A UWB interference source that causes a small increase in the noise level of a wireless communications or GPS receiver that is some distance from the source will cause more significant increase[s] in the noise level of the receiver as the distance between source and receiver decreases. With proliferation of UWB sources throughout an area, the likelihood of at least one UWB interference source being close enough to any particular wireless communications or GPS receiver to cause a significant increase in its noise level increases significantly.").

^{13/} *NPRM* at ¶ 18.

^{14/} *Id.* at ¶ 27.

^{15/} *Id.* at ¶¶ 34-59.

^{16/} *Id.* at ¶ 40.

though by its own admission it does not yet know how, when, where UWB devices will be deployed, what the full interference ramifications of UWB deployment will be (either for individual UWB devices operating alone or in the aggregate), which users of licensed spectrum will be at greatest risk of interference from UWB technology, or whether the remedies available under Part 15 will be sufficient to compensate such users for any loss of service or other damages they may suffer by virtue of UWB interference. Moreover, the Commission appears to be proposing that it will address any flaws in its UWB interference rules in subsequent rulemakings as more information about UWB technology becomes available, which would be tantamount to regulating UWB interference on a *post hoc* basis.

Notwithstanding its concerns that the Commission's *NPRM* appears to be premature, and the fact that any *post hoc* regulation of UWB interference would be flatly inconsistent with Commission precedent,^{17/} WCA looks forward to participating in and filing reply comments on any technical studies that are being conducted with respect to UWB technology, and to otherwise contributing its perspective on the extremely important technical and legal issues identified above. Whatever the marketplace benefits of UWB may be, however, the Commission's fundamental obligation to protect existing users of spectrum from harmful interference must remain the cornerstone of this proceeding.^{18/} WCA submits that the highly unsettled status of

^{17/} See, e.g., *Amendment of the Commission's Rules to Establish Part 27, the Wireless Communications Service*, 12 FCC Rcd 3977, 3983-4 (1997).

^{18/} See, e.g., *Red Lion Broadcasting Co., Inc. v. Federal Communications Commission*, 395 U.S. 367, 375-6 (1969) ("In 1927, the allocation of frequencies was left entirely to the private sector,

UWB technology and the concomitant risks of harmful interference to licensed incumbents require rigorous enforcement of that policy here, and that under no circumstances should the Commission permit any unlicensed operation of UWB devices on any frequency band unless and until (1) the proponents of UWB technology produce clear and compelling evidence that such operation will not cause harmful interference, and (2) all fixed wireless broadband providers and other interested parties have had an opportunity to study and submit comments on such evidence, and make alternative recommendations to the Commission as necessary.

Finally, for the reasons set forth above, while WCA does not object to the licensing of UWB devices on an experimental basis to facilitate further testing and study of UWB technology, the Commission must ensure that neither its Part 5 Rules for experimental authorizations nor its waiver policies are utilized to facilitate any marketing of UWB devices before completion of this proceeding. As argued quite forcefully by NTIA:

We note . . . that the UWB systems proposed by the Petitioners represent only a few of the many such systems that are being marketed. We are concerned that some companies are manufacturing and marketing UWB systems without necessary authorization, and consequently waiver requests for UWB devices might proliferate rapidly before NTIA and the FCC could develop a suitable regulatory framework. Therefore, to avoid the kind of complex and lengthy coordination required for these three Petitioners, we urge that additional waivers of Part 15 rules to permit the marketing of UWB devices that emit radio

and the result was chaos. It quickly became apparent that broadcast frequencies constituted a scarce resource whose use could be regulated and rationalized only by the Government. Without government control, the medium would be of little use because of the cacophony of competing voices, none of which could be clearly and predictably heard. Consequently, the Federal Radio Commission was established to allocate frequencies among competing applicants in a manner responsive to the public "convenience, interest, or necessity." (footnotes omitted).

frequency energy in the restricted bands be suspended or extremely limited until further analyses and measurements have been completed and a regulatory framework developed.^{19/}

In sum, it must be remembered that regardless of the frequencies involved, fixed wireless broadband is a *service*, and there is absolutely no doubt that fixed wireless broadband subscribers will not tolerate interruptions or delays in service caused by unresolved UWB interference. Instead, they will migrate to incumbent cable operators and local exchange carriers who already have a head start in the deployment of broadband services, and who are not exposed to the same risk of third-party interference. Given the Commission's broad Congressional mandate to "encourage the deployment on a reasonable and timely basis of advanced telecommunications capability to all Americans,"^{20/} there is no public interest justification for the Commission to unleash unlicensed UWB devices into the marketplace without careful consideration and review

^{19/} *NTIA Letter* at 4.

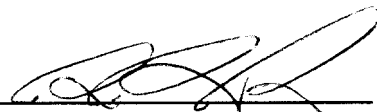
^{20/} Telecommunications Act of 1996, Pub. L. No. 104-104, § 706(a), 110 Stat. 153 (1996).

of all of the interference ramifications associated with UWB technology. WCA urges the Commission to conduct these proceedings with that principle in mind.

Respectfully submitted,

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